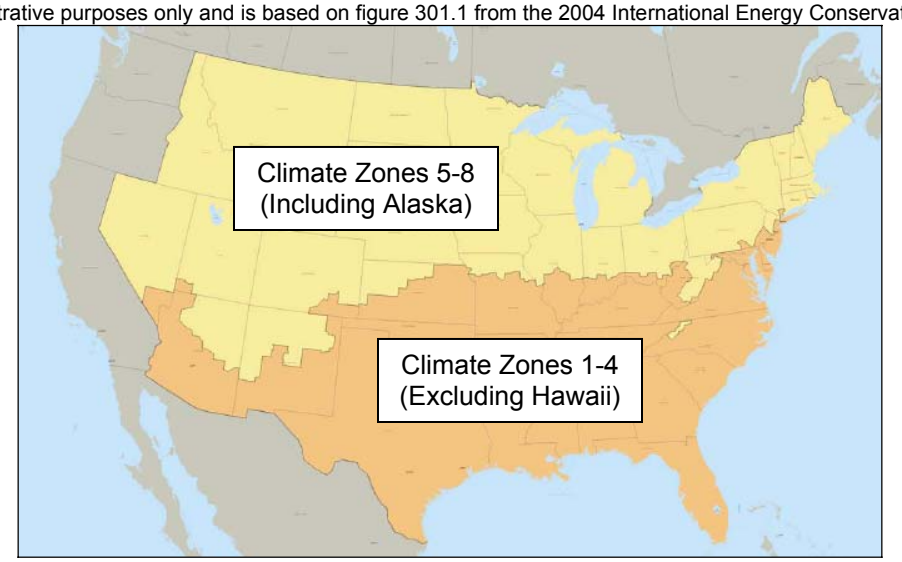
ENERGY STAR Qualified Homes *[DRAFT 7/27/05]* National Builder Option Package

General requirements for the ENERGY STAR Builder Option Package (BOP) are specified in the table below.
To qualify as ENERGY STAR, in addition to meeting the requirements of this BOP, a home must be verified and field-tested in accordance with the HERS Guidelines by a RESNET-accredited Provider and meet all state and local codes.

For county specific information refer to the ENERGY STAR Qualified Homes Verification Checklist at www.energystar.gov/homes.

	Hot Climates[1] (2004 IECC Climate Zones 1,2,3,4)	**Mixed and Cold Climates**[1] (2004 IECC Climate Zones 5,6,7,8)
Cooling Equipment [2] (Where Provided)	Right-Sized: ENERGY STAR Qualified 14 SEER A/C; or ENERGY STAR Qualified 14 SEER Heat Pump	Right-Sized: 13 SEER A/C; or ENERGY STAR Qualified 14 SEER Heat Pump
Heating Equipment [2]	Right-Sized: 80 AFUE Gas Furnace; ENERGY STAR Qualified 8.5 Heat Pump[3]; 80 AFUE Boiler[4];or 80 AFUE Oil Furnace	Right-Sized: ENERGY STAR Qualified 90 AFUE Gas Furnace; ENERGY STAR Qualified 8.5 HSPF Heat Pump[3]; ENERGY STAR Qualified 85 AFUE Boiler[4];or 85 AFUE Oil Furnace
Thermostat [3]	ENERGY STAR Qualified Thermostat	
Ductwork	Leakage[5]: ≤ 4 cfm to Outdoors / 100 sq. ft. and ≤ 9 cfm Total / 100 sq. ft; and 2003 IECC Compliant Insulation Levels[6,7]	
Envelope	Infiltration[8,9]: 7 ACH50 CZ's 1-2; 6 ACH50 CZ's 3-4; 5 ACH50 CZ's 5-7; 4 ACH50 CZ 8; and Insulation Levels Equivalent to HERS Reference Home[7]; and Compliance with Thermal Bypass Inspection Checklist[10]	
Windows	ENERGY STAR Qualified Windows or Better[11]	
Water Heater [12]	Gas: 40 Gal = 0.61 EF, 60 Gal = 0.57 EF, 80 Gal = 0.53 EF Electric: 40 Gal = 0.93 EF, 50 Gal = 0.92 EF, 80 Gal = 0.89 EF Oil[4]: Integrated with Space Heating Boiler	
Lighting and Appliances [13,14]	Five or More ENERGY STAR Qualified Light Fixtures, Fans Equipped with Lighting Fixtures (Ceiling or Bath), and/or Appliances	

Map is for illustrative purposes only and is based on figure 301.1 from the 2004 International Energy Conservation Code.



Note: Due to the unique nature of some state codes, EPA has agreed to allow regionally developed definitions of ENERGY STAR in California, Hawaii, and the Pacific Northwest to continue to define program requirements.

ENERGY STAR Qualified Homes *[DRAFT 7/27/05]* Builder Option Package Notes

1. The appropriate climate zone for each building site shall be determined by the 2004 International Energy Conservation Code (IECC), Figure 301.1.
2. All requirements for ENERGY STAR qualified equipment shall be based on the latest ENERGY STAR specifications. Heating and cooling equipment should be sized according to RESNET-approved proper sizing protocols. More information on these protocols can be found in chapter 3,B.6.b.(7) of the HERS Standard.
3. In homes with heat pumps, programmable thermostats must have "ramp-up" technology to prevent the excessive use of electric back-up heating.
4. In homes with oil or gas hydronic equipment, domestic water heating must be provided by the space heating boiler (tankless).
5. Ducts must be sealed and tested to 4 cfm to outdoors / 100 sq. ft. of conditioned floor area and 9 cfm total / 100 sq. ft. Duct leakage testing can be waived if the ducts are located in conditioned space AND the envelope leakage has been tested to be at or below 3 ACH50 OR at or below 0.25 cfm50 per square foot of the building envelope. Duct leakage must be determined and documented by a RESNET-certified rater using a RESNET-approved testing protocol.
6. To prevent condensation, a minimum of R-4 insulation is recommended for ducts in conditioned space.
7. Insulation shall be equivalent to the 2006 HERS Reference Home.
8. Tested envelope leakage must be determined and documented by a RESNET-certified rater using a RESNET- approved testing protocol.
9. To ensure consistent exchange of indoor air, installation of a whole house mechanical ventilation system is recommended.
10. Each Thermal Bypass Inspection Checklist item must be verified. The Checklist includes the following 12 areas:
    1. Shower/Tub at Exterior Wall
    2. Insulated Floor above Garage
    3. Attic Knee Walls
    4. Attic Hatch/Drop-down Stair
    5. Cantilevered Floor
    6. Duct Shafts
    7. Flue Shaft
    8. Piping Shaft/ Penetrations
    9. Dropped Ceiling/Soffit
    10. Fireplace Wall
    11. Staircase Framing at Exterior Wall/Attic
    12. Whole-house Fan Attic Penetration
11. All windows must qualify as ENERGY STAR (with the exception of Climate Zone 2 which must meet a U-value $\leq$ 0.55 and SHGC $\leq$ 0.35 and Climate Zone 4 which must meet a U-value $\leq$ 0.40 and SHGC $\leq$ 0.45). The specifications for ENERGY STAR qualified windows can be found at www.energystar.gov.

    For homes with window area exceeding 21% window to floor area (WFA), the following additional requirements apply:

    a. In IECC Climate Zones 1, 2 and 3, an improved window Solar Heat Gain Coefficient (SHGC) is required and is determined by:

    Required SHGC = [0.18 / WFA] * [ENERGY STAR SHGC]

    Where the ENERGY STAR SHGC is the minimum required SHGC of a climate appropriate ENERGY STAR qualified window.

    Note: Solar window screens may be used to meet required SHGC beyond the ENERGY STAR SHGC. The overall SHGC for a window unit with solar screen is determined by the following equation:

    [(window SHGC) x (solar screen SHGC) x (% area covered)] + [window SHGC x % area not covered].

    b. In IECC Climate Zones 5, 6, 7 and 8, an improved window U-Value is required and is determined by:

    Required U-Value = [0.18 / WFA] * [ENERGY STAR U-Value]

    Where the ENERGY STAR U-Value is the minimum required U-Value of a climate appropriate ENERGY STAR qualified window.

    Additionally, all decorative glass and skylight window area counts towards the maximum window area. Up to 0.5% WFA may be used for windows with decorative glass that does not meet ENERGY STAR requirements. Likewise, a maximum of 1.0% WFA may be used for skylights. For example, a house with total above-grade conditioned floor area of 2,000 square feet may have only 10 square feet (0.5% of 2,000) of decorative glass and 20 square feet (1% of 2,000) of skylight area.
12. Visit www.energystar.gov for DHW EF requirements of additional tank sizes or use the following equations:
    Gas DHW EF ≥ 0.69-(0.002 x Tank Gallon Capacity); Electric DHW EF ≥ 0.97-(0.001 x Tank Gallon Capacity).
13. Any combination can be installed to meet this requirement. ENERGY STAR qualified lighting fixtures installed in the following locations cannot be counted towards compliance with the ENERGY STAR reference home: storage rooms of any kind (e.g., closets, pantries, sheds), laundry rooms, or garages. Additional efficiency and savings can be achieved by installing other ENERGY STAR qualified products throughout the house (e.g., additional lighting, appliances, etc.).
14. Efficient lighting fixtures represent a significant opportunity for persistent energy savings and a meaningful way to differentiate ENERGY STAR qualified homes from those meeting minimum code requirements. EPA intends to add the ENERGY STAR Advanced Lighting Package (ALP) as an additional requirement to the prescriptive path in 2009 and will, as part of the process, propose this change for industry comment in 2008. To learn more about the ALP, refer to www.energystar.gov/homes.